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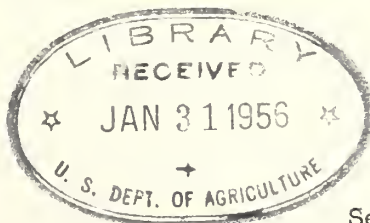
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THE EFFECT OF VARIOUS PRICE REDUCTIONS ON MILK
CONSUMPTION IN MASSACHUSETTS SCHOOLS WITH PREVIOUS
HIGH LEVELS OF MILK CONSUMPTION /

This report summarizes the findings and conclusions of one in a series of studies of the Special School Milk Program undertaken by State educational agencies in cooperation with the United States Department of Agriculture, Agricultural Marketing Service. Funds to conduct these studies were made available by the Commodity Credit Corporation to permit the appraisal and development of new and more effective methods of increasing the availability and consumption of milk in schools.

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This study was undertaken by the Massachusetts Department, of Education, in the fiscal year 1955. Supervising the study was John C. Stalker, Director, Office of School Lunch Program, Massachusetts Department of Education. Immediately in charge of the project was Alfred Pleasonton. John D. Black, Department of Agricultural Economics, Harvard University, served as Consultant.



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THE EFFECT OF VARIOUS PRICE REDUCTIONS ON MILK
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Purpose of Study

The purpose of the study was to determine the effect of experimental price reductions on milk consumption in schools where milk consumption had already reached a high level.

Procedure for Conduct of Study

The sample studied consisted of 107 schools with an average daily school milk consumption level of at least 0.60 half pints per child prior to the experiment. Schools were selected from 41 representative communities in the State. A "control group" of 74 schools, with a similar level of milk consumption was selected from 20 communities.

The prices of half pints of milk sold as extra milk in the 107 schools were reduced on April 1 for the remainder of the school year. In 20 schools the price was reduced by 3 cents per unit of milk (5¢ to 2¢ or 4¢ to 1¢). The price was reduced by 2 cents per unit in 81 schools (5¢ to 3¢, 4¢ to 2¢, or 3¢ to 1¢). In 6 schools only a 1 cent per half pint reduction was made (4¢ to 3¢ or 3¢ to 2¢).

The prices of milk in the 74 "control" schools remained unchanged during the experiment.

April and May were the two months for which sales of milk were analyzed in the selected schools to determine the effectiveness of the price reductions in increasing consumption over levels prevailing in March before the reductions took place.

NOTE: In this summary, "extra" milk refers to milk bought a la carte at noon, (separate from the milk included in the lunch (Type A) meal), at recess, or between or during classes.

Conclusions

The following appear to be the most significant conclusions:

1. The greater the amount of the price reduction, the greater the increase in sales of extra milk. Reductions of one cent per half pint showed no significant change in milk consumption.
2. The lower the absolute price charged the greater the increase in sales of extra milk.
3. Price reductions in the experimental schools raised total milk consumption from an average of .75 half pint per pupil per day in March to .88 half pint per pupil per day in April and May. This was an increase of 17 percent. In the control schools, where prices were not reduced, per capita daily consumption was .74 half pint in March, .72 in April and .74 in May.
4. The largest increases in consumption occurred in schools serving milk more than once a day.

Analysis of Data

The Effect of the Amount of Price Reductions On the Percentage Increase in Milk Consumption.

A significant relationship revealed by this study was the relationship between the amount of the price reduction and the amount of the increase in consumption. The 20 schools which reduced prices by 3 cents per half pint had an average percentage increase $\frac{1}{2}$ in a la carte milk sales of 152 percent (median percentage increase was 118). The 81 schools which reduced the prices by 2 cents per unit had an average percentage increase of 83 percent (median percentage of 31). The 6 schools which reduced the price 1 cent per half pint had virtually no change in consumption. While the study indicated a definite over-all association between the amount 1/ Simple arithmetic average of percentage increases.

of price reduction and the amount of consumption increase, individual schools in each price reduction category showed considerable variation in consumption increases. For example, in the 14 schools where prices were reduced from 5 cents to 2 cents, changes in consumption ranged from a decrease of 2 percent to an increase of 538 percent, with 9 of the 14 schools showing increases above 50 percent. (As pointed out in the study, the extreme variations were usually due to special factors or circumstances such as the attitudes of school officials or initiation of new times of service.)

Table I. Percentage increase in student purchases of milk in selected Massachusetts schools as related to specific price reductions per half pint.

Prices		Amount	Number	Percentage Increase in Milk Sales ^{a/}			
Charged Students:		of Price	of	"Extra" Milk		Total Milk Sales	
March	April	Reduction	Schools				
cents			(No.)	(Av. ^{b/})	(Median ^{c/})	(Av. ^{b/})	(Median ^{c/})
5	2	3	14	129	60	22	18
4	1	3	6	221	206	100	96
Sub-total			20	152	118	46	25
5	3	2	34	36	15	9	5
4	2	2	42	119	38	26	21
3	1	2	5	100	50	26	14
Sub-total			81	83	31	19	15
4	3	1	5	- 3	1	-3	0
3	2	1	1	5		2	
Sub-total			6	- 2	2	-2	0
Control Group		0	74	1	0	0	0

^{a/} Percentage increase over March 1955, the month immediately preceding the price reduction.

^{b/} Arithmetic average of percentage increases.

^{c/} Median percentage.

The Effect of the Absolute Price on the Percentage Increase in Consumption

There was a high correlation between the absolute price at which the milk was sold and the increases in sales. The highest price at which milk was sold in any of the 107 schools after the special price reduction was 3 cents per half pint. There were 39 schools in this group. These schools had a smaller percentage increase in both extra and total milk sales than did the 57 schools whose absolute price was 2 cents. Eleven schools, with an absolute price of 1 cent per half pint, had by far the greatest percentage increase in milk consumption. The following table shows these relationships.

Table II. Increases in milk sales as related to prices charged to students.

Number : Absolute Price		Percentage Increase in Milk Sales ^{a/}			
of : to Students		Extra Milk		Total Milk Sales	
Schools: (Per Half Pint)		Average ^{b/}	Median	Average ^{b/}	Median
39	3¢	31	19	7	4
57	2¢	115	40	25	20
11	1¢	166	150	66	82

^{a/} Percentage increase over March 1955, the month immediately preceding the price reduction.

^{b/} Arithmetic average of the percentage increases.

In this case also, a wide range in consumption increases was noted from school to school in each price category.

The increase in total milk consumption was due primarily to increases in sales of the extra milk to which the experimental price reductions applied. Consumption increases were appreciably greater in the 44 schools which offered milk at recess, between or during classes than in the 63 schools which provided additional milk only during the lunch period.

Comparing May consumption with that for March, the schools offering milk at additional times of the day achieved consumption increases in extra milk which averaged 156 percent while those offering additional milk at noon only achieved increases of only 50 percent.

Per Capita Milk Consumption

The daily per capita level of milk consumption (total milk) in the 107 schools increased during the experiment by 17 percent (from an average of 0.75 half pints to an average of 0.88 half pints), while in the "control" schools, the consumption level remained approximately the same. Elementary schools showed a greater response to the decrease in student price than did the secondary schools. Persons handling the milk sales were able to bring the reduction in price more forcibly to the attention of the individual pupils in the smaller schools, which were mostly of elementary grade.

Table III below compares milk consumption in 107 schools in which experimental price reductions were in effect for April and May 1955, with milk consumption in March 1955. Also shown are similar comparisons for the "control" or "matched" group.

Table III. Daily per pupil milk consumption and percentage increases in consumption for selected groups of schools.

Group	: Daily School Milk Consumption in Half Pints			
	: Per Pupil		: Percent Increase	
	: March	: April	: May	: May Over March
Experimental Group	.75	.88	.88	17
Experimental Group Less Lunches at Home <u>a/</u>	.77	.90	.90	17
31 Secondary Schools	.79	.89	.89	13
11 All-Grade Schools	.81	.97	1.01	25 <u>b/</u>
65 Elementary Schools	.70	.87	.87	24
37 Rural Schools	.80	.90	.90	12
70 Urban Schools	.74	.88	.88	19
"Control" Group (74 schools)	.74	.72	.74	0

a/ These consumption rates are equal to daily total milk consumption divided by an enrollment figure which has been reduced by the number of children who normally eat lunch at home in the 21 schools in which such children constitute 5 percent or more of the total enrollment.

b/ This group had a 20 percent increase in April over March which further increased to 25 percent in May.

Other Findings and Comments

As a part of the study interviews with school officials included an inquiry as to the reasons why some children did not buy milk at school.

The results of this inquiry are summarized as follows:

1. Very few children were reported to be allergic to milk or had medical or dietary reasons for not buying it; but many high school girls avoided milk for fear of gaining weight.

2. Religious reasons accounted for only a very few rejections of milk.

3. Going home to lunch reduced milk purchases a little.

4. Many children brought milk or another beverage from home -- (Chocolate milk and carbonated beverages were frequently cited) or bought another beverage at or near school.

5. Most children not buying milk at school reported their reasons as:

- a. A few preferred raw milk.
- b. Some reported the milk not cool enough.
- c. Many preferred the "quality" (or at least the taste) of the milk delivered at home by a different local dairy.
- d. Most of them reportedly did not like milk without an added sweetened flavor.

The authors of the study reported that:

"The results of this inquiry as to reasons for not buying more milk at school are more significant than appear at first. Part of these reasons tend to put somewhat of an upper limit upon how much sales can be increased by a mere lowering of the price. Under this head come preferring other unpasteurized milk or flavored milk or other beverages; also fear among the girls of gaining weight, and going home for lunch. No doubt some of the erratic variability in the response to the lower prices is due to the various proportions of the pupils of this description."

